WHAT IS CLAIMED IS:

1. A method of correlation, the method comprising the steps of:

identifying a feature in an input data stream;

storing a starting time associated with the identified feature relative to a boundary of the input data stream;

measuring a time interval until the identified feature is next repeated in the input data stream;

comparing the measured time interval to each of a set of valid interval values for the identified feature; and

calculating a difference between the stored starting time and a starting time associated with the identified feature relative to a boundary of a reference data sequence when the measured time interval matches one of the valid interval values;

wherein the calculated difference determines an amount that the input data stream must be time-shifted to achieve correlation with the reference data sequence.

2. The method of claim 1, wherein a feature is comprised of sequences of cycle periods included in the input data stream.

3. The method of claim 2, wherein the step of identifying a feature comprises the steps of:

detecting positive or negative zero-crossings in the input data stream;

measuring a first cycle period between consecutive positive or negative detected zero-crossings;

comparing the first measured cycle period to each of a set of cycle periods associated with the input data stream;

measuring a second cycle period between consecutive positive or negative detected zero-crossings immediately following the first cycle period and a third cycle period between consecutive positive or negative detected zero-crossings immediately following the second cycle period when the first measured cycle period matches one of the set of cycle periods associated with the input data stream; and

comparing the first, second, and third cycle periods to a set of expected cycle period sequences associated with the input data stream;

wherein a feature is identified when all periods match in sequence one of the set of expected cycle period sequences.

4. The method of claim 3, further comprising the step of:

quantizing the input data stream into two levels corresponding to respective positive and negative excursions of data in the stream before detecting positive or negative zero-crossings in the stream.

5. The method of claim 1, wherein the input data stream includes symbols of a specific length and each symbol is individually correlated to the reference data sequence.

6. The method of claim 5, wherein the boundary of the input data stream corresponds to the start of a symbol.

7. The method of claim 5, wherein each symbol period includes a time-shifted or rotated form of the reference data sequence.

8. The method of claim 7, wherein the reference data sequence is comprised of subsections.

9. The method of claim 8, wherein each subsection includes a time-shifted or rotated form of the reference data sequence.

10. The method of claim 8, wherein the identified feature and next repeated identified feature in the input data stream are located in respective adjacent subsections of the time-shifted or rotated reference data sequence that form each symbol period.

11. A method of correlation, the method comprising the steps of:

searching for transitions of cycle periods in an input data stream including a number of subsections to determine a transition time for each of the subsections;

identifying a feature in the input data stream;

storing a starting time associated with the identified feature;

calculating a first offset between the stored starting time and a nearest earlier determined transition time;

calculating a second offset between the nearest earlier determined transition time and a boundary of the input data stream;

comparing the calculated first offset with a set of valid offset values for the identified feature to identify the subsection in which the feature is located; and

subtracting the second offset from a known offset between a transition time for the identified subsection and a boundary of a reference data sequence;

wherein the result of the subtraction determines an amount that the input data stream must be time-shifted to achieve correlation with the reference data sequence.

12. The method of claim 11, wherein the step of searching for transitions of cycle periods comprises the steps of:

detecting positive or negative zero-crossings in the input data stream;

measuring a first cycle period between consecutive positive or negative detected zero-crossings;

measuring a second cycle period between consecutive positive or negative detected zero-crossings immediately following the first cycle period;

determining if the first cycle period and second cycle period span consecutive subsections;

measuring a third cycle period between consecutive positive or negative detected zero-crossings immediately preceding a next expected subsection transition time and measuring a fourth cycle period between consecutive positive or negative detected zero-crossings immediately following the third cycle period if the first cycle period and second cycle period span consecutive subsections;

determining if the third cycle period and fourth cycle period span the next expected subsection; and

determining the transition time for each of the subsections based upon the next expected subsection transition time if the third cycle period and fourth cycle period span the next expected subsection.

13. The method of claim 12, further comprising the step of:

quantizing the input data stream into two levels corresponding to respective positive and negative excursions of data in the stream before detecting positive or negative zero-crossings in the input data stream.

14. The method of claim 11, wherein the step of identifying a feature comprises the steps of:

detecting positive or negative zero-crossings in the input data stream;

measuring a first cycle period between consecutive positive or negative detected zero-crossings;

comparing the first measured cycle period to each of a set of cycle periods associated with the input data stream;

measuring a second cycle period between consecutive positive or negative detected zero-crossings immediately following the first cycle period, and a third cycle period between consecutive positive or negative detected zero-crossings immediately following the second cycle period when the first measured cycle period matches one of the set of cycle periods associated with the input data stream; and

comparing the first, second, and third cycle periods to a set of expected cycle period sequences associated with the input data stream;

wherein a feature is identified when all periods match in sequence one of the set of expected cycle period sequences.

15. The method of claim 14, further comprising the step of:

quantizing the input data stream into two levels corresponding to respective positive and negative excursions of data in the stream before detecting positive or negative zero-crossings in the input data stream.

16. The method of claim 11, wherein the input data stream includes symbols of a specific length and each symbol is individually correlated to the reference data sequence.

17. The method of claim 16, wherein the boundary of the input data stream corresponds to the start of a symbol.

18. The method of claim 17, wherein each symbol period includes a time-shifted or rotated form of the reference data sequence.

19. The method of claim 11, wherein each subsection includes a time-shifted or rotated form of the reference data sequence.

20. A correlator, comprising:

a start feature state machine that identifies a feature in an input data stream and determines a start time relative to a boundary of the input data stream when the feature is identified;

an end feature state machine that determines an end time when the identified feature is next repeated in the input data stream;

an interval subtractor that subtracts the start time from the end time to define an interval for the identified feature;

memory including a set of stored valid interval values for the identified feature and a set of reference start times relative to a boundary of a reference data sequence, each reference time corresponding to a respective one of the stored valid interval times for the identified feature;

a feature interval state machine that validates the interval produced by the interval subtractor for the identified feature by comparing the interval with each of the valid interval values for the identified feature stored in the memory; and

a position subtractor that calculates the difference between the start time relative to the boundary of the input data stream and a reference time corresponding to a valid interval value that matches the interval produced by the interval subtractor;

wherein the calculated difference determines an amount that the input data stream must be time-shifted to achieve correlation with the reference data sequence.

21. The correlator of claim 20, wherein a feature is comprised of sequences of cycle periods included in the input data stream.

22. The correlator of claim 21, further comprising:

a zero-crossing detector that detects positive or negative zero-crossings of a data in an input data stream; and

a period detector that measures cycle periods between consecutive positive or negative detected zero-crossings.

23. The correlator of claim 22, further comprising:

logic that measures a first cycle period between consecutive positive or negative detected zero-crossings;

logic that compares the first measured cycle period to each of a set of cycle periods associated with the input data stream;

logic that measures a second cycle period between consecutive positive or negative detected zero-crossings immediately following the first cycle period and a third cycle period between consecutive positive or negative detected zero-crossings immediately following the second cycle period when the first measured cycle period matches one of the set of cycle periods associated with the input data stream; and

logic that compares the first, second, and third cycle periods to a set of expected cycle period sequences associated with the input data stream;

wherein a feature is identified when all periods match in sequence one of the set of expected cycle period sequences.

24. The correlator of claim 23, wherein the zero-crossing detector comprises:

a comparator that quantizes the input data stream into two levels corresponding to respective positive and negative excursions of data in the stream before detecting positive or negative zero-crossings in the stream.

25. The correlator of claim 20, wherein the input data stream includes symbols of a specific length and each symbol is individually correlated to the reference data sequence.

26. The correlator of claim 25, wherein the boundary of the input data stream corresponds to the start of a symbol.

27. The correlator of claim 25, wherein each symbol period includes a time-shifted or rotated form of the reference data sequence.

28. The correlator of claim 27, wherein the reference data sequence is comprised of subsections.

29. The method of claim 28, wherein each subsection includes a time-shifted or rotated form of the reference data sequence.

30. The correlator of claim 28, wherein the identified feature and next repeated identified feature in the input data stream are located in respective adjacent subsections of the time-shifted or rotated reference data sequence that form each symbol period.